Claims

1. Method for providing multicast for streaming transmission from a streaming server to users of a multicast group with a multicast/broadcast server providing multicast transmission and with a streaming node providing a streaming transmission based on an on-demand single-user signalling supporting the transmission of a streaming flow

characterised in that

an intermediate node is provided including the multicast/broadcast server and the streaming node with the following

- the intermediate node establishes a bearer for a multicast transmission according to the requirements for streaming transmission,
- the intermediate node establishes a multi-user streaming session on the bearer by translating the on-demand single-user signalling received from the streaming server into multi-user push signalling,
- the intermediate node adapts the received streaming flow to the multicast transmission according to the needs of a multicast group or subgroup of a multicast group,
- the intermediate node replicates the received streaming transmission according the number of the multicast subgroups.

2. Method according to claim 1 characterised in that the steaming node communicating with the server adapts the streaming transmission and forwards the adapted streaming transmission to the multicast/broadcast server, which replicates the received streaming transmission among subgroups of a multicast group.

3. Method according to claim 1 characterised in that the multicast/broadcast server communicating with the server replicates the received streaming transmission among the subgroups of a multicast group and forwards each replicated streaming transmission to the streaming node, which adapts each streaming transmission.

4. Method according to claim 1, 2 or 3 characterised in that a decision unit is provided for deciding how the received streaming flow is to be directed in the intermediate node.

5. Method according to claim 3 or 4 characterised in that the streaming nodes have different capabilities and the multicast/broadcast server knows the different capabilities and addresses of the streaming nodes in order to select an appropriate streaming node for performing an appropriate adaptation of the streaming flow.

6. Method according to claim 5 characterised in that in case a hierarchical coding is used the streaming flows are differentiated in the sense that a different number of layers is sent to different streaming nodes.

7. Method according to one of the claims 1 to 6 characterised in that the intermediate node administrates an address identifying the streaming flow arriving from the server.

8. Method according to one of the claims 1 to 7 characterised in that the intermediate node receives a session description message informing about the transmission parameters required for the streaming session and forwards the received parameters to

the group members by means of the multi-user push signalling message.

9. Method according to one of the claims 1 to 7 characterised in that the intermediate node receives a session description message informing about the transmission parameters required for the streaming session and said intermediate node changes the received parameters according to the needs of the subgroups that receive a dedicated replicated stream and sends the changed parameter to the group members by means of the multi-user push signalling message.

10. Method according to claim 9 characterised in that nodes higher up in the hierarchy are informed that the streaming flow is only to be forwarded to a single node lower in the hierarchy by means of a new message being distributed along the multicast delivery tree.

11. Method according to one of the claims 1 to 10 characterised in that the conversion between single-user on-demand and multi-user push signalling implies that certain messages are not propagated.

12. Method according to one of the claims 1 to 11 characterised in that the replication of the streaming flow is based on an access network, in which users are located or/and on the geographic area and/or on the Quality of Service a subgroup wishes for streaming sessions.

13. Method according to claim 12 characterised in that the intermediate node requests the actual characteristics of the area in order to adapt the streaming flow accordingly.

14. Method according to one of the claims 1 to 13 characterised in that the intermediate node provides additional information to the charging/billing server in order to guarantee an accurate charging and/or multi-user streaming related charging.

15. Intermediate node being adapted to provide multicast for streaming transmission from a streaming server to group members of a multicast group with a multicast/broadcast server providing multicast transmission and with a streaming node providing a streaming transmission based on an on-demand single-user signalling supporting the transmission of a streaming flow

characterised in that

said intermediate node includes the multicast/broadcast server and the streaming node with the following

- bearer establishing means in multicast/broadcast server for establishing a bearer for a multicast transmission according to the requirements for streaming transmission received from the server,
- session establishing means in multicast/broadcast server for establishing a multi-user streaming session on the bearer by translating the on-demand single-user signalling received from the streaming server into multi-user push signalling,
- adaptation means in the streaming node for adapting the received streaming flow to the multicast transmission according to the needs of a multicast group,
- replication means for replication of the received streaming transmission according the number of the multicast subgroups.

16. System being adapted to provide multicast for streaming transmission from a streaming server to group members of a multicast group with a multicast/broadcast server providing

multicast transmission and with a streaming node providing a streaming transmission based on an on-demand single-user signalling supporting the transmission of a streaming flow

characterised in that

said system has an intermediate node according to claim 15 and the method according to claim 1 is performed within the system.